Claims

[c1]

1.A method for separating a composite fluid into component parts comprising:

providing a rotor configuration having:

a rotor that includes

a composite fluid containment area;

a fluid inlet channel having an inlet height;

a peripheral fluid separation channel having a first end, a second end and a central section;

first and second separated fluid outlet channels; and

first and second separated component collection areas;

wherein said inlet channel is disposed in fluid communication with said fluid containment area; and wherein said peripheral separation channel is disposed in fluid communication with said fluid inlet channel in said central section of said separation channel and with said first separated fluid outlet channel adjacent said first end of said separation channel, and with said second separated fluid outlet channel adjacent said second end of said separation channel; and wherein said first and second separated fluid outlet channels are disposed in fluid communication with said first and second separated component collection areas, respectively; and

wherein said inlet channel and said first and second separated fluid outlet channels also have respective inlet and first and second outlet heights, said first height being less than said second height, and

loading a composite fluid into the composite fluid containment area of said rotor configuration; and

rotating said rotor configuration to separate said composite fluid into its component parts.

[c2]

2.A method according to Claim 1 that further includes collecting said separated components.

[c3]

3.A method according to Claim 1 that further includes automatically driving the flow through said separation channel.

[c4]

4.A method according to Claim 1 that further includes automatically shutting off the flow through said separation channel.

[c5]

5.A method according to Claim 1 that further includes automatically readjusting the flow in and through said separation channel by automatically equalizing fluid pressure in the first and second separated fluid outlet channels.

[c6]

6.A method according to Claim 1 which further includes which further includes collecting said separated components and clamping the flow out of said separation channel prior to said step of collecting said separated components.

[c7]

7.A method according to Claim 6 that further includes automatically centrifugally clamping the flow out of said separation channel until a preselected rotational speed is achieved.

[c8]

8.A method according to Claim 6 that further includes automatically centrifugally clamping the flow out of said separation channel after collection of said separated components when a preselected rotational speed is no longer achieved.

[c9]

9.A method according to Claim 6 that further includes automatically capturing an intermediate phase component in said separation channel by clamping the flow out of said separation channel after collection of said first and second separated components when a preselected rotational speed is no longer achieved.

[c10]

10.A method according to Claim 1 that further includes: using a disposable bag and tubing set within said rotor configuration.

[c11]

11.A method according to claim 1 wherein said separation channel is semi-spiraled about an axis of rotation of said rotor.

[c12]

12.A method according to claim 11 wherein said first end of said separation channel has a first separation channel height and said second end of said separation channel has a second separation channel height and said first separation channel height is less than said second separation channel height.

[c13]

13.A method according to claim 12, further comprising rotating said rotor in a selected rotational direction and wherein said first end of said separation channel is behind said inlet channel with respect to said selected rotational direction, whereby relatively denser component parts of said composite fluid tend to flow against said rotational direction towards said first end.

[c14]

14.A method according to claim 1 wherein said first collection area is disposed radially inwardly from said separation channel and between said inlet channel and said first outlet channel and wherein said second collection area is disposed radially inwardly

from said separation channel and between said inlet channel and said second outlet channel.

[c15]

15.A method according to claim 14 wherein said collection areas comprise pockets, said pockets being tilted radially downwardly and outwardly from an axis of rotation of said rotor.

[c16]

16.A method according to claim 1 wherein said rotor further comprises at least one extension extending from at least one of said outlet channels into the collection area of said at least one channel, said extension having a fixed end connected to said at least one channel and a free end in said collection area, the height of said at least one channel being determined with respect to said free end of said extension.

[c17]

17.A method according to claim 1, wherein said rotor further comprises

a plurality of processing areas, each processing area having

a composite fluid containment area;

a fluid inlet channel having an inlet height;

a peripheral fluid separation channel having a first end, a second end and a central section;

first and second separated component outlet channels; and

first and second separated component collection areas;

wherein said inlet channel is disposed in fluid communication with said fluid containment area; and wherein said peripheral separation channel is disposed in fluid communication with said fluid inlet channel in said central section of said separation channel, and with said first separated fluid outlet channel adjacent said first end of said separation channel, and with said second separated fluid outlet channel adjacent said second end of said separation channel; and wherein said first and second separated fluid outlet channels are disposed in fluid communication with said first and second separated component collection areas, respectively; and

wherein said first and second separated fluid outlet channels also have respective first and second heights, said first height being less than said second height,

each of said processing areas being symmetrically disposed about an axis of rotation of said rotor.

[c18]

18.A method according to claim 17 comprising at least four processing areas.

[c19]

19.A method according to claim 18 wherein each peripheral separation channel comprises a semi-spiraled arc.

[c20]

20.A method according to claim 17, each processing area further comprising at least one extension extending from at least one of said outlet channels into the collection area of said at least one channel, said extension having a fixed end connected to said at least one channel and a free end in said collection area, the height of said at least one channel being determined with respect to said free end of said extension.

[c21]

21.A method according to claim 20, each processing area further comprising an extension extending from each of said outlet channels.

[c22]

22.A method according to claim 21 wherein each collection area has a central section and an outlet channel connects to said collection area in said central section.